

Appn. No. 09/755,752
Amtd. dated: December 1, 2004
Reply to Final Office Action dated September 10, 2004

REMARKS

These remarks are set forth in response to the Final Office Action mailed September 10, 2004, (the "Final Office Action"). As this response has been timely filed within the three-month statutory period, neither an extension of time nor a fee is required.

At the time of the Final Office Action, claims 1-24 were pending in the Patent Application. Claims 1-3, 6-11, 13-15 and 18-23 were rejected under 35 U.S.C. §102(e) as being anticipated by Patent No. 5,923,648 to Dutta (hereinafter "Dutta"). In addition, claims 5 and 17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Dutta in view of Patent No. 5,592,470 to Rudrapatna, et al. (hereinafter "Rudrapatna"). Claims 4 and 16 were also rejected under §103(a) as being unpatentable over Dutta and further in view of Patent 5,666,364 to Pierce, et al. (hereinafter "Pierce"). Finally, claims 12 and 24 were rejected under §103(a) as being unpatentable over Rudrapatna, et al. and further in view of Patent No. 6,404,769 to Kapoor (hereinafter "Kapoor").

I. Review of Applicant's Invention

Prior to addressing the Examiner's rejections on art, a brief review of Applicant's invention is appropriate. Applicant's invention concerns a method and system for improving the capacity of cellular telephone networks that make use of repeaters. In particular, the system uses conventional air interface protocols for communications between a mobile subscribed unit and a repeater, but uses packetized communications protocol for the wireless backhaul link between the repeater and the base transceiver station (BTS). For example a packet data traffic channel (PTCH) is provided that includes an uplink and a downlink channel. The PTCH can be used concurrently with multiple active mobile subscribers. Different mobile subscriber units can have access to a single PTCH at specified times and for selectable periods of time for greater efficiency. The invention eliminates the need for a dedicated backhaul channel for each mobile unit and thereby reduces the number of carrier frequency channels required for backhaul communications. The unused RF carrier frequency channels are then free to be used for carrying additional mobile traffic capacity.

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II. Rejection under 35 U.S.C. §102(e) based on Dutta

The Examiner has rejected claims 1-3, 6-11, 13-15 and 18-23 as being anticipated by Dutta. Dutta discloses an orbiting satellite communications relay system having a Land Earth Station (LES) and a corresponding satellite dish antenna 150 that communicates with mobile terminals 130 through an earth orbiting satellite 155. Dutta's system uses a simple modified TDMA system in which selected time frames in a return channel are dedicated exclusively to message traffic for one mobile terminal, and other time periods on the return channel are usable by any of a plurality of such terminals for signaling transmission. However, Dutta does not support message traffic for multiple mobile terminals on a single channel.

Claims 1 and 13 recite a method and a system, respectively, for improved backhaul efficiency between a cellular base station and at least one repeater communicating with the cellular base station over a wireless backhaul link. Dutta does not disclose such a method. In particular, Dutta does not disclose a method in which a backhaul is established between a cellular base station and a repeater. Instead, Dutta concerns an orbiting satellite communications relay system. The Examiner asserts that Dutta's satellite dish antenna 150 is a cellular base station and that the communications link between Dutta's satellite 155 and dish antenna 150 is equivalent to the claimed backhaul link. However, as is well known in the art, a cellular base station can wirelessly communicate directly with cellular telephones and connect such cellular telephones to a telephone network. Moreover, a cellular base station typically is an omni-directional communication station. Dutta's dish antenna 150 does not communicate directly with cellular telephones and is not omni-directional. Accordingly, Dutta does not disclose a method for improved backhaul efficiency between a cellular base station and at least one repeater.

Claims 1 and 13 also recite dynamically assigning for the backhaul link at least one packet channel for transmission of selected packets containing traffic data on a backhaul signal for a subscriber. The packet channel comprises at least an RF frequency and a channel definition. Packet channels are used so that a time slot is

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allocated for the transmission of the packet only while the time slot is needed. Upon completion of the transmission, the time slot is made available for the transfer of other traffic. Dutta does not disclose this step. Specifically, Dutta fails to disclose dynamically assigning at least one packet channel for the backhaul link. Instead, Dutta discloses a conventional TDMA system in which individual time slots are not assignable for sending message traffic from a plurality of mobile terminals. In fact, selected time slots are dedicated exclusively to message traffic for a single mobile terminal, and other time slots must be allocated for sending message traffic from other mobile terminals.

Claims 2 and 14 recite performing the assigning step in response to a request for communicating over the backhaul signal by one of the plurality of mobile subscribers. Dutta wholly fails to disclose this limitation. Indeed, Dutta does not mention a backhaul signal anywhere in his specification.

Claims 3 and 15 each depend from claims 2 and 14, respectively, and recite that the request includes a priority field. Notwithstanding that Dutta does not disclose such a request; Dutta also does not disclose a priority field being sent by a mobile subscriber. The Examiner asserts that this limitation is disclosed in Col. 13, lines 9-25, however, the cited passage pertains to classification of data as real time data and non-real time data. Nowhere does Dutta disclose that such classifications are provided by the mobile user. Instead of using a priority field to prioritize data, Dutta teaches that each class of data is transmitted at its distinct rate commensurate with the respective degree of time-criticality of the data. Col. 13, lines 13-16.

Claims 6 and 18 recite that the channel definition includes a set of parameters which define the packet channel, the packet parameters comprising at least one of (a) a number of the selected packets which can be sent over the assigned packet channel; and (b) a number of frames allocated for transmission of the selected packets. Dutta does not disclose either of these parameters. The Examiner asserts that Dutta discloses a parameter for a number of selected packets which can be sent over the assigned packet channel in col. 7, lines 54-55 and at col. 28, lines 21-24. Col. 7, lines 54-55 state that outgoing network management information and received user messages can be provided in formatted blocks or frames of digital information. Col. 28,

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lines 21-24 discloses that the number of in-use or active return channels of any particular channel group can vary based on the message volume carried by the particular channel group. Neither of these cited passages disclose the recited limitation of a channel definition which includes the number of selected packets which can be sent over an assigned packet channel.

The Examiner also asserts that Dutta discloses a number of frames allocated for transmission of the selected packets at Col. 20, line 65 through col. 21, line 10. The cited passage discloses how to determine the number of return channel slots which are assigned to a transmit frame, not how many frames are allocated for transmission of the selected packets.

Claims 8 and 20 recite that the backhaul signal comprises at least one data type selected from the group consisting of user traffic and control data. As noted, Dutta does not disclose a backhaul signal as the term is understood to those skilled in the art and as the term is used in applicant's specification, and thus Dutta does not anticipate the recited limitation. Similarly, claims 10, 11, 21 and 22 are directed to the use of a backhaul link, and thus not anticipated by Dutta.

III. Rejection under 35 U.S.C. §103(a) based on Dutta in view of Rudrapatna

The Examiner has rejected claims 5 and 17 under 35 U.S.C. 103(a) as being unpatentable over Dutta and further in view of U.S. Patent No. 5,592,470 to Rudrapatna et al. ("Rudrapatna"). Claims 5 and 17 depend from claim 1 and recite the step of dynamically reassigning at least a portion of the assigned packet channel for transmission of a second backhaul channel. Thus, a single packet channel can be used to transmit a plurality of backhaul channels. The Examiner has asserted that this limitation is disclosed in Rudrapatna at col. 6, lines 4-29. However, nowhere in the cited passage does Rudrapatna disclose the recited limitation. Although, the cited passage is directed to reallocating channel assignments, Rudrapatna lacks any teaching or suggestion of transmitting a second backhaul channel on at least a portion of an assigned packet channel.

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IV. Rejection under 35 U.S.C. §103(a) based on Dutta in view of Pierce

Claims 4 and 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Dutta and further in view of U.S. Patent No. 5,666,364 to Pierce et al. ("Pierce"). However, Pierce merely discloses a method for coordinating the receipt of incoming calls to a subscriber in a multi-network communication environment. Pierce does not make up for the deficiencies of Dutta. In particular Pierce does not disclose or suggest Applicant's use of a packet switched network for implementation of a backhaul channel between a BTS and a repeater in a cellular communication system.

V. Rejection under 35 U.S.C. §103(a) based on Dutta in view of Rudrapatna and Kapoor

Claims 12 and 24 were rejected under 35 U.S.C. 103(a) as being unpatentable over Rudrapatna et al. and further in view of U.S. Patent No. 6,404,769 to Kapoor ("Kapoor"). Claims 12 and 24 each recite that the at least one repeater comprises a plurality of repeaters, and that at least one packet channel is used to transmit packets between multiple repeaters selected from the plurality of repeaters and the cellular base station. The Examiner has asserted that this limitation is disclosed by Kapoor at col. 4, lines 22-41. Kapoor discloses a satellite communication system including a ground based centralized controller. Although the cited passage discloses a plurality of crosslinks for transferring information packets between satellites, nowhere in the cited passage does Kapoor teach or suggest using one packet channel to transmit packets between multiple repeaters. Indeed, at col. 4, lines 37-39, Kapoor states that a plurality of signaling channels are used by the centralized controller to communicate with each of the satellites in the system. Accordingly, Kapoor actually teaches away from the recited limitation of using one packet channel to transmit packets between multiple repeaters. Thus, Kapoor is not properly combinable with Rudrapatna and Dutta to sustain a rejection of claims 12 and 24. *In re Grasselli*, 713 F.2d 731, 744 (Fed. Cir. 1983). See also MPEP § 2145(X)(D)(2) (8th ed. 2003).

VI. Conclusion

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For the foregoing reasons, this entire application is believed to be in condition for allowance. Consequently, such action is respectfully requested. The Applicant requests that the Examiner call the undersigned if clarification is needed on any matter within this Amendment, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,

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